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Report of the technical review of the sixth national communication of Ukraine

Parties included in Annex I to the Convention are requested, in accordance with decision 9/CP.16, to submit a sixth national communication to the secretariat by 1 January 2014. In accordance with decision 7/CMP.8, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their sixth national communication supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

This report presents the results of the technical review of the sixth national communication and supplementary information under the Kyoto Protocol of Ukraine conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol".

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I. Introduction and summary

A. Introduction

1. For Ukraine, the Convention entered into force on 11 August 1997 and the Kyoto Protocol on 16 February 2005. Under the Convention, Ukraine made a commitment to reducing its greenhouse gas (GHG) emissions by 20.0 per cent by 2020 below the 1990 level. Under the Kyoto Protocol, Ukraine committed itself to keeping its GHG emissions at the base year level[1] during the first commitment period, from 2008 to 2012. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Ukraine committed to reduce its GHG emissions by 24.0 per cent below the base year level.

2. This report covers the in-country technical review of the sixth national communication (NC6) of Ukraine, coordinated by the secretariat, in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (decision 23/CP.19) and the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1).

3. The review took place from 27 October to 1 November 2014 in Kiev, Ukraine, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Medea Inashvili (Georgia), Ms. Aglaia Obrekht (Canada), Mr. Janis Rekis (Latvia) and Ms. Olga Vavilonskaya (Belarus). Ms. Obrekht and Ms. Inashvili were the lead reviewers. The review was coordinated by Mr. Javier Hanna (secretariat).

4. During the review, the expert review team (ERT) reviewed each section of the NC6. The ERT also reviewed the supplementary information provided by Ukraine as a part of the NC6 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Ukraine in its 2013 annual submission and previous submissions and elaborated further in its 2014 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

5. In accordance with decisions 23/CP.19 and 22/CMP.1, a draft version of this report was communicated to the Government of Ukraine, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Summary

6. The ERT conducted a technical review of the information reported in the NC6 of Ukraine in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines on NCs). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[2] is provided in the NC6 (see para. 120 below). The supplementary information on the minimization of adverse impacts referred to in

[1] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

[2] Decision 15/CMP.1, annex, chapter II.

paragraph 4 above is mostly complete and mostly transparent (see paras. 123 and 124 below).

7. Ukraine considered part of the recommendations provided in the report of the in-depth review of the fifth national communication (NC5) of Ukraine.[1] The ERT commended Ukraine for its improved reporting of some parts of the NC6, namely, the national system and national registry sections. During the review, Ukraine provided further relevant information on recent changes in national circumstances and institutional and legal arrangements due to political events that occurred in 2014.

1. Completeness and transparency of reporting

8. Gaps and issues related to the reported information identified by the ERT are presented in table 1 below.

2. Timeliness

9. The NC6 was submitted on 30 December 2013, before the deadline of 1 January 2014 mandated by decision 9/CP.16. On 28 October 2014, Ukraine submitted an addendum to its NC6, including information on policies and measures (PaMs) in accordance with Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties, and information on implementation of policies targeting reduction of emissions from international transportation, including aviation and marine bunker fuels. The addendum also contains information on technology transfer to developing countries and support to them in their adaptation activities and capacity-building through education of foreign students in ecology, climatology and meteorology. The ERT took note of this information.

3. Adherence to the reporting guidelines

10. The information reported by Ukraine in its NC6 is mostly in adherence to the UNFCCC reporting guidelines on NCs as per decision 4/CP.5 (see table 1).

[1] FCCC/IDR.5/UKR

Table 1

Assessment of completeness and transparency issues of reported information in the sixth national communication of Ukraine[a]

Sections of national communication	*Completeness*	*Transparency*	*Reference to paragraphs*	*Supplementary information under the Kyoto Protocol*	*Completeness*	*Transparency*	*Reference to paragraphs*
Executive summary	Complete	Mostly transparent	12	National systems	Complete	Transparent	
National circumstances	Complete	Transparent		National registries	Mostly complete	Transparent	23
Greenhouse gas inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
Policies and measures (PaMs)	Mostly complete	Partially transparent	35, 39	PaMs in accordance with Article 2	Complete	Mostly transparent	70
Projections and total effect of PaMs	Mostly complete	Partially transparent	76, 78, 79, 81, 91	Domestic and regional programmes and/or arrangements and procedures	Partially complete	Transparent	30, 32, 33, 122
Vulnerability assessment, climate change impacts and adaptation measures	Mostly complete	Transparent	106	Information under Article 10[b]	NA	NA	101
Financial resources and transfer of technology[c]	NA	NA		Financial resources[c]	NA	NA	
Research and systematic observation	Mostly complete	Mostly transparent	112	Minimization of adverse impacts in accordance with Article 3, paragraph 14	Mostly complete	Transparent	123
Education, training and public awareness	Complete	Transparent					

Abbreviation: NA = not applicable.

[a] A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the chapter on conclusions and recommendations.

[b] For the purposes of reporting information in this table, this assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant for developed country Parties and other developed Parties included in Annex II to the Convention only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example, research and systematic observation.

[c] Reporting on financial resources under the Kyoto Protocol is relevant for developed country Parties and other developed Parties that are included in Annex II to the Convention (Annex II Parties). As Ukraine is not an Annex II Party and has an economy in transition, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol

A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol

1. Information on relevant national circumstances

11. In its NC6, Ukraine has provided a detailed description of the national circumstances and elaborated on the framework legislation and key policy documents on climate change. Further information on the review of the institutional and legislative arrangements for the coordination and implemeniation of PaMs is provided in chapter II.B below.

12. The executive summary of the NC6 gives a good overview of the national communication (NC); however, the ERT recommends that Ukraine limit the number of pages in the executive summary to 15. In addition, the ERT noted that the executive summary could benefit from a clearer, more concise, structure, as well as from an improved quality assurance process to improve the information provided and avoid repetitive paragraphs.

13. The ERT noted that the national circumstances chapter of the NC6 did not include the trend of gross domestic product (GDP) of the country, and encourages Ukraine to include this information in its next NC.

14. During the review, Ukraine provided additional information on the national circumstances, elaborating on the recent developments in the framework legislation and institutional arrangements since the submission of the NC6. Given the major political transformations that occurred in Ukraine in 2014, the legal, administrative and institutional framework for policymaking has changed. This includes: (a) the return to the Constitution of 2004; (b) the signing of an Association Agreement between the European Union (EU) and Ukraine (hereinafter referred as to the Association Agreement), its ratification and the elaboration of an action plan for its implementation; and (c) presidential and parliamentary elections, with consequent changes in governmental structure, including entities responsible for Convention-related activities at the national level. The additional information provided was complete and transparent. The ERT commends Ukraine for providing comprehensive information on institutional and legal arrangements in the country, including the following recent changes in 2014: election of a new president, appointment of parliamentary elections, signing of the Association Agreement with the EU and elaboration of the action plan for its implementation. The ERT noted that the main executive structures (State Environmental Investment Agency (SEIA) and Ministry of Ecology and Natural Resources (MENR)) in the Ukraine responsible for Convention-related activities in the country had been non-operational while waiting for transformation after the parliamentary elections. The ERT encourages Ukraine to report on any changes and new developments in its national circumstances in its next NC submission, including changes in the legal basis for its climate change policy in accordance to its new national circumstances.

15. The ERT noted that during the period 1990–2012, Ukraine's population and GDP decreased by 12.1 and 30.3 per cent, respectively, while GHG emissions per GDP and GHG emissions per capita decreased by 38.8 and 51.5 per cent, respectively. Table 2

illustrates the national circumstances of Ukraine by providing some indicators relevant to GHG emissions and removals.

Table 2
Indicators relevant to greenhouse gas emissions and removals for Ukraine

	1990	*2000*	*2005*	*2010*	*2012*	*Change 1990–2012 (%)*	*Change 2011–2012 (%)*
Population (million)	51.89	49.18	47.11	45.87	45.59	–12.1	–0.2
GDP (2005 USD billion using PPP)	486.03	211.16	305.53	321.26	338.64	–30.3	0.2
TPES (Mtoe)	251.98	133.79	142.88	132.43	122.66	–51.3	–3.1
GHG emissions without LULUCF (kt CO_2 eq)	944 352.64	413 841.10	428 511.56	388 062.63	402 665.95	–57.4	–1.7
GHG emissions with LULUCF (kt CO_2 eq)	874 615.54	363 010.45	390 084.44	350 069.50	375 425.12	–57.1	–6.8
GDP per capita (2005 USD thousand using PPP)	9.37	4.29	6.49	7.00	7.43	–20.7	0.4
TPES per capita (toe)	4.86	2.72	3.03	2.89	2.69	–44.6	–2.8
GHG emissions per capita (t CO_2 eq)	18.20	8.42	9.10	8.46	8.83	–51.5	–1.4
GHG emissions per GDP unit (kg CO_2 eq per 2005 USD using PPP)	1.94	1.96	1.40	1.21	1.19	–38.8	–1.9

Sources: (1) GHG emission data: Ukraine's 2014 GHG inventory submission, version 1.5; (2) Population, GDP and TPES data: International Energy Agency.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

2. Information on the greenhouse gas inventory, emissions and trends

16. In its NC6, Ukraine has provided a summary of information on GHG emission trends for the period 1990–2011. This information is fully consistent with the 2013 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO_2 eq) (given in the common reporting format tables), are provided in an annex to the NC6. During the review, the ERT took note of the 2014 annual submission (version 1.5). The relevant information therein is reflected in this report.

17. Total GHG emissions[4] excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 57.4 per cent between 1990 and 2012, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 57.1 per cent over the same period. The ERT noted that GHG emissions have decreased substantially since 1990. Decreasing GHG emission trends were driven by the transition from a centrally planned economy to a market economy, which resulted in essential structural changes in all sectors of the economy, but mainly in the energy sector. The more recent decrease in emissions (2007–2009) was driven by the global financial crisis. The decrease of total GHG emissions was mainly due to a reduction in CO_2 emissions, in particular, from the energy sector, which decreased by 57.9 per cent over this

[4] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding land use, land-use change and forestry, unless otherwise specified.

period. Emissions of methane (CH_4) decreased by 59.2 per cent and emissions of nitrous oxide (N_2O) decreased by 46.6 per cent. The contribution from fluorinated gases (F-gases) to total GHG emissions was negligible throughout this period; however, they collectively increased by 263.0 per cent. The main source of CO_2 and CH_4 emissions in Ukraine is the energy sector (including transport), while the agriculture sector is the dominant source of N_2O emissions. Industrial processes are the second largest source of CO_2 emissions, while the agriculture and waste sectors come after the energy sector as main CH_4 emission sources. An analysis of the drivers of GHG emission trends in each sector is provided in chapter II.B below. Table 3 provides an overview of GHG emissions by sector from 1990 to 2012.

Table 3
Greenhouse gas emissions by sector in Ukraine, 1990–2012

	GHG emissions (kt CO_2 eq)				*Change (%)*		*Share[a] by sector (%)*	
Sector	*1990*	*2000*	*2010*	*2012*	*1990–2012*	*2011–2012*	*1990*	*2012*
1. Energy	750 348.41	324 141.02	294 651.07	309 081.09	–58.8	1.2	79.5	76.8
A1. Energy industries	272 049.30	7 041.61	102 641.86	119 156.18	–56.2	6.3	28.8	29.6
A2. Manufacturing industries and construction	194 416.97	75 377.75	59 393.58	64 205.61	–67.0	3.4	20.6	15.9
A3. Transport	72 954.69	29 608.77	37 186.20	33 473.86	–54.1	–8.7	7.7	8.3
A4–A5. Other	114 975.99	54 746.52	50 331.63	47 695.08	–58.5	–2.1	12.2	11.8
B. Fugitive emissions	95 951.45	67 366.37	45 097.80	44 550.35	–53.6	–9.2	10.2	11.1
2. Industrial processes	79 842.20	42 280.27	47 676.67	46 009.22	–42.4	–5.8	8.5	11.4
3. Solvent and other product use	4.69	6.84	123.07	176.44	3 664.3	1.2	0.0005	0.04
4. Agriculture	103 602.53	37 372.46	34 563.26	36 033.19	–65.2	–0.7	11.0	8.9
5. LULUCF	–69 737.10	–50 830.64	–37 993.13	–27 240.83	–60.9	319.9	–7.4	–6.8
6. Waste	10 554.82	10 040.51	11 048.56	11 366.02	7.7	1.2	1.1	2.8
7. Other	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	**874 615.54**	**363 010.45**	**350 069.50**	**375 425.12**	**–57.1**	**–6.8**	**NA**	**NA**
GHG total without LULUCF	**944 352.64**	**413 841.10**	**388 062.63**	**402 665.95**	**–57.4**	**–1.7**	**100.0**	**100.0**

Source: Ukraine's 2014 GHG inventory submission, version 1.5 (for GHG emission data).

Note: The changes in emissions and the share by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

3. National system

18. Ukraine provided in its NC6 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The description includes all the elements mandated by decision 15/CMP.1. The ERT took note of the review of the changes

to the national system as reflected in the report of the individual review of the GHG inventory of Ukraine submitted in 2013.

19. During the review, Ukraine provided additional information on the national system, elaborating on recent changes in institutional arrangements due to events that have occurred in the country since publication of the NC6. The changes relate to liquidation of SEIA (the former main entity responsible for UNFCCC reporting) in September 2014, the transfer of its powers and functions to MENR, and the legal changes at national and international levels affecting the politics and economics in the country, which mainly refer to the return to the 2004 Constitution, the signing of the Association Agreement with the EU, and presidential and parliamentary elections that may entail further institutional changes in the whole national system. During the review, Ukraine provided complete and transparent information about these changes.

20. The ERT commends Ukraine for providing comprehensive information on institutional and legal arrangements in the country, including the recent changes. Ukraine may consider establishing bodies responsible for the Convention processes in the country, based on new national circumstances, to ensure its commitments to the Convention are met, including those regarding the national system as established in the guidelines for national systems. The ERT encourages Ukraine to reflect these and other changes in its next NC submission. The ERT also encourages Ukraine to continue working on the legal basis for its climate change in order to enhance its effectiveness and meet all requirements of the new national circumstances.

4. National registry

21. In its NC6, Ukraine has provided information on the national registry in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1. The ERT took note of the review of the changes to the national registry as reflected in the report of the individual review of the GHG inventory of Ukraine submitted in 2013.

22. The NC6 does not include a description of the registry modernization activities that took place during 2012–2013, aimed at technical improvement. The schematic picture of these technical changes, provided in the NC6, does not ensure clarity of the character of the improvements in the national registry. During the review, Ukraine provided information about the recent changes in the national registry as a result of modernization activities.

23. The ERT recommends that Ukraine include a description of changes to the registry due to the modernization or other activities in accordance with the requirements of the annex to decision 15/CMP.1, in its next NC submission.

5. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

24. Ukraine has reported in its NC6 information on domestic programmes and/or legislative arrangements and procedures related to the Kyoto Protocol.

25. Given the major political transformations that have happened in Ukraine in 2014 since publication of the NC6, the legal, administrative and institutional framework for climate change related policymaking has changed. During the review, Ukraine provided additional information elaborating on the recent developments, which was complete and transparent (see para. 14 above).

26. According to the most recent institutional arrangements, the overall responsibility for climate change policymaking lies within MENR, and a number of national institutions are involved in the implementation of this policy. Prior to September 2014, this responsibility lay with SEIA, the former main entity responsible for Convention and Kyoto

Protocol reporting arrangements and procedures, whereas MENR had been overlooking and coordinating the activities of SEIA. Other institutions with relevance in the institutional arrangements of the country include the Inter-Agency Commission (IAC) on implementation of Ukraine's commitments under the Convention and the Kyoto Protocol, established in 1999 by resolution no. 583 of the Cabinet of Ministers of Ukraine and chaired by the minister of MENR with deputy ministers of departments and other central government authorities, representatives of parliament, the National Security Council, academic institutions and non-governmental organizations (NGOs) as participating members. IAC is responsible for the following activities:

(a) Organizing development of the national strategy and national plan of action to implement the commitments of Ukraine under the Convention and the Kyoto Protocol;

(b) Developing proposals for the implementation of the Kyoto Protocol mechanisms;

(c) Coordinating the activities of ministries and other national and local executive bodies, enterprises, institutions and organizations in implementing the national action plan on fulfilling commitments under the Convention and the Kyoto Protocol;

(d) Organizing the preparation of NCs and biennial reports;

(e) Organizing the preparation of the national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs;

(f) Reviewing official communications to be sent to the secretariat, and draft directives for official government delegations to international events on climate change and reports on the results of participation in these activities.

27. Another important institution with an active role in the institutional arrangements in Ukraine is the Budget Institution National Center for Inventory of Greenhouse Gases, which operated under SEIA in the past, and which will continue to operate under MENR in the new arrangements. This institution is responsible for the collection, processing, classification, analysis, storage and archiving of information relevant for the preparation and reporting of national GHG inventories.

28. According to the projections provided in the NC6, the ERT noted that Ukraine is very likely to meet its Kyoto Protocol target for the first commitment period without the implementation of additional PaMs or the use of Kyoto Protocol mechanisms. Nevertheless, Ukraine is hosting a number of joint implementation (JI) projects (see paras. 68 and 94 below). Implementation of the Kyoto Protocol in the future will also be underpinned by the recently signed Association Agreement, which requires that Ukraine:

(a) Implement the Kyoto Protocol commitments, including all eligibility criteria for fully using the Kyoto Protocol mechanisms;

(b) Develop an action plan for long-term mitigation actions and adaptation activities to climate change (i.e. post-2012);

(c) Develop and implement long-term measures to reduce GHG emissions.

29. On 17 September 2014, an action plan on the implementation of the Association Agreement was approved by the Cabinet of Ministers of Ukraine, which will establish a legal framework for Ukraine to participate in the EU emissions trading scheme, as well as for regulating F-gases in Ukraine. In addition, the Ukraine law 'On Fundamentals (Strategy) of the State Environmental Policy of Ukraine until 2020' supports the national climate change policies, and has the following four objectives:

(a) Optimizing the energy sector by increasing the use of energy sources with low CO_2 emissions by 10.0 per cent by 2015, and by 20.0 per cent by 2020 compared to the 2010 level;

(b) Determining the basic policy framework on adaptation to climate change, development and phased implementation of a national action plan to prevent anthropogenic impact on the climate for the period to 2030;

(c) Improving energy efficiency by 25.0 per cent by 2015 and by 50.0 per cent by 2020 relative to the 2010 level by implementing energy and resource conservation in energy-consuming sectors;

(d) Increasing the use of renewable and alternative energy sources by 25.0 per cent by 2015 and 55.0 per cent, respectively, by 2020 relative to the 2010 levels.

30. In its NC6, Ukraine provided information about the international projects implemented via the JI mechanism of the Kyoto Protocol (see paras. 68 and 94 below) and the green investment scheme (GIS) with Japan and Spain. In addition, a regional programme for the Poltava region is described in great detail in the NC6. The ERT noted that the NC5 included a number of other regional programmes that have not been included in the NC6. During the review, Ukraine provided additional information explaining that information about the other regional programmes was omitted due to the lack of monitoring and evaluation of those programmes. The ERT noted that the transparency of reporting would benefit if Ukraine would provide information to clearly identify regional programmes that have ceased to exist and other regional programmes that are implemented or operational but there is no monitoring or evaluation of their activities. The ERT noted that in the NC6 a description of Ukraine's enforcement and administrative procedures in place to meet its commitments under the Kyoto Protocol, including the legal authority for such procedures, now they are implemented, and procedures for addressing cases of non-compliance under domestic law, is not provided. The ERT recommends that Ukraine enhance the completeness of its reporting by including all the relevant information indicated above in its next NC.

31. As indicated in paragraph 19 above, SEIA was responsible for implementation of the Kyoto Protocol mechanisms in the recent past, and since September 2014, all SEIA functions have been transferred to MENR. According to the resolution of the Cabinet of Ministers of Ukraine, SE "Gosekoinvest" has been selected as a recipient of the funds and the organization responsible for the competitive selection of the contractors to perform the work required, for signing the contracts with the contractors, and for ensuring the completion of entrusted projects. This work has been supported by several regulations focusing primarily on the approval of the relevant procedures pertaining to the JI and GIS projects:

(a) Regulation of the Cabinet of Ministers of Ukraine of 22 February 2006 no. 206 (2008 edition) 'On approval of the procedure for preparation review, approval and implementation of projects aimed at reduction of anthropogenic emissions of greenhouse gases';

(b) Regulation of the Cabinet of Ministers of Ukraine of 22 February 2008 no. 221 (2010 edition) 'On approval of the procedure for review, approval and implementation of environmental (green) investment projects in the commitment period of Kyoto Protocol to the United Nations Framework Convention on Climate Change';

(c) Regulation of the Cabinet of Ministers of Ukraine of 28 May 2008 no. 504 'On establishment and maintenance of the National Electronic Registry of Anthropogenic Emissions and Absorption of Greenhouse Gases'.

32. The NC6 does not include information required in the annex to decision 15/CMP.1 on any provisions to make information on legislative arrangements and enforcement and administrative procedures publicly accessible. This information has been provided to the ERT during the review. Information on legislative arrangements and enforcement and administrative procedures is publicly accessible on the SEIA website.[5] The ERT recommends that Ukraine include this information in its next NC submission.

33. During the review, Ukraine provided missing information about national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. In Ukraine, PaMs related to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are implemented in line with the activities under the Convention on Biological Diversity (Verkhovna Rada of Ukraine ratified this convention on 29 November 1994). The regulation of the Cabinet of Ministers of Ukraine of 22 September 2004 no. 675-r approved the "Concept of the state program of biodiversity conservation for 2005–2025,"[6] which allows Ukraine to conduct actions aimed to ensure synergy between the climate change activities, including those related to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and activities under the Convention on Biological Diversity.[7,8] The ERT recommends that Ukraine include this information in its next NC submission. The ERT noted that the PaMs related to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are implemented under the authority of the Convention on Biological Diversity.

B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

34. Ukraine has provided in its NC6 limited information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol, including on its policy context and national targets and objectives set to implement its commitments under the Convention.

1. Policies and measures related to implementation of commitments under the Convention

35. In its NC6, Ukraine provided information on its PaMs. However, this information was not structured by sector (energy, transport, industry, agriculture, forestry and waste management), or by gas (CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6)). The ERT noted that a summary table of PaMs for each sector including the estimates of mitigation impacts by gas has not been provided in the NC6, while a similar table with relevant information was provided in the first biennial report (BR1) of Ukraine. The ERT recommends that Ukraine structure the NC section on PaMs by sector and by gas, with each sector having its own textual description of the principal PaMs, supplemented by summary table 1 of the UNFCCC reporting guidelines on NCs, including information on name and short description of the PaM, objectives, GHGs affected, type of PaM, status of implementation, and implementing entity or entities.

[5] Available at <www.seia.gov.ua>.
[6] Available at <http://zakon1.rada.gov.ua/laws/show/675-2004-%D1%80>.
[7] Fourth national report of Ukraine under the Convention on Biological Diversity (in Russian). Available at <http://www.cbd.int/doc/world/ua/ua-nr-04-ru.pdf>.
[8] Draft fifth national report of Ukraine under the Convention on Biological Diversity (in Ukrainian). Available at <http://www.menr.gov.ua/index.php/protection/protection6/vykonannya/convencia/divalnist/914-natsionalni-zvity-kbr>.

36. The ERT further noted that in cases where the PaMs are cross-sectoral, Ukraine may include a separate text and a table describing cross-sectoral PaMs in its next NC.

37. Ukraine has not provided comprehensive information in its NC6 on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. In the section on projections of its NC6, Ukraine provided information, in the form of charts, tables and diagrams, comparing the different projection scenarios ('without measures', 'with measures' and 'with additional measures'); however, the ERT noted that there is nothing pertaining to that in the section on PaMs, including any textual description of how the PaMs are changing the long-term GHG emission trends of Ukraine.

38. In addition, the ERT noted that Ukraine did not provide information on the objectives of each policy and a quantitative estimate of the impacts of individual PaMs or collections of PaMs, in the form of estimated changes in activity levels and/or emissions and removals due to adopted and implemented PaMs reported, and a brief description of estimation methods.

39. The ERT recommends that Ukraine provide information in its next NC on how it believes its PaMs are modifying long-term trends in anthropogenic GHG emissions and removals consistent with the objectives of the Convention.

40. Furthermore, the ERT encourages Ukraine to describe the objectives of each policy, include descriptions of activities and/or source and sink categories affected, and provide quantitative estimates of the impacts of individual PaMs or collections of PaMs. The ERT noted that providing this information in a descriptive textual form, as well as in the form of a table and/or chart, would enhance the transparency of reporting.

41. The ERT noted that the NC6 does not include information on costs of its reported PaMs, non-GHG mitigation benefits and interactions of PaMs at the national level. To increase the completeness and transparency of reporting, the ERT encourages Ukraine to include this information in its next NC.

42. The ERT noted that the NC6 does not include information required by the UNFCCC reporting guidelines on NCs on innovative and/or effectively replicable PaMs, PaMs influencing international transport, PaMs that could lead to higher emissions and the rationale for such PaMs, and monitoring and evaluation of PaMs. The ERT encourages Ukraine to include this information in its next NC submission.

43. The ERT noted that the NC6 did not provide estimates of GHG reductions from any of the PaMs reported in a comprehensive and coherent manner, while the BR1 does provide estimates for the three overarching policies/programmes: projects under GIS; the sector energy efficiency and conservation programme; and the state target economic programme for energy efficiency and development of production of energy from renewable energy and sources and alternative fuels. The ERT encourages Ukraine to provide estimates of the impact of individual PaMs on GHG emissions in its next NC.

44. The NC6 contains a set of PaMs that is, to a large extent, different from that included in the NC5. The NC6 highlights the unpredictability of PaMs given the constantly changing political and financial situation in Ukraine. In many cases, the laws and policies are being designed and passed, but are then cancelled at a later stage as a result of budgetary constraints. The ERT noted that it is unclear what happened to many PaMs that have been reported in the NC5, but which are not mentioned in the NC6. From the information provided, it is difficult for the ERT to understand which PaMs have been implemented, are still being planned or have been cancelled altogether. The ERT encourages Ukraine to provide information about the status of and/or changes to the policies described in its previous NC.

45. During the review, Ukraine provided additional information on PaMs (including the ones that have been adopted since publication of the NC6) to the ERT to supplement the information contained in its NC6, including information disaggregating some of the major overarching policies into subset of policies and providing more information about the specific PaMs, with estimates of the energy savings. The ERT noted that this information was useful to better understand the PaMs in Ukraine; however, the ERT further noted that as no additional estimates on the impact on GHG emissions were provided, it was difficult to assess whether, in its NC6, Ukraine gave priority to those PaMs adopted, implemented and planned that provide the most significant contributions to its GHG emission reduction efforts.

46. The ERT encourages Ukraine to provide transparent information clearly distinguishing between the planned, adopted and implemented PaMs in its next NC submission (e.g. by providing information on the funds already provided towards the policy, the future budget allocated and the time frame for implementation). The ERT further encourages Ukraine to transparently report on how it gives priority to PaMs, or combinations of PaMs, that have the most significant impacts on GHG emissions and removals.

47. The ERT noted that none of the recommendations related to PaMs made in the in-depth review report of the NC5 were taken into consideration in order to improve reporting on PaMs in the NC6. The ERT encourages Ukraine to address the issues raised during the review of the previous NC.

2. Policy framework and cross-sectoral measures

48. According to the projections provided in the NC6, the ERT noted that Ukraine is very likely to meet its Kyoto Protocol target for the first commitment period without the implementation of additional PaMs or the use of the Kyoto Protocol mechanisms (see para. 83 below). Nevertheless, Ukraine is hosting a number of JI projects (see paras. 68 and 94 below). The ERT also noted that Ukraine's PaMs focus on reducing its dependence on international energy suppliers rather than on reducing its GHG emissions. Some of the policies are targeted at increasing energy efficiency; resulting in a decrease of GHG emissions (see para. 55 below). Other policies that are aimed at switching from foreign to domestic energy supply and increasing the production and use of coal and natural gas would result in an increase of GHG emissions (see para. 53 below).

49. The key framework climate and energy policy is included in the following laws and regulations:

(a) The law 'On Fundamentals (Strategy) of the State Environmental Policy of Ukraine until 2020', which is focused on: optimization of the energy sector and increasing the use of energy sources with low CO_2 content; reducing GHG emissions in accordance with Ukraine's international obligations under the Kyoto Protocol; development and implementation of the national action plan on climate change, etc.;

(b) The national action plan for energy efficiency for the period up to 2020, with the main goals of increasing energy efficiency in the industrial, transportation and residential sectors, and increasing public awareness of climate change;

(c) The energy strategy until 2030, which specifies goals and objectives for energy conservation and efficient use of energy resources, as well as providing quantitative targets in terms of energy intensity of GDP;

(d) The state target economic programme for energy efficiency and development of production of energy from renewable energy and sources and alternative fuels for the

period to 2017, which was developed for the mining and metallurgical sectors, and chemicals and other industrial sectors of the economy.

50. A significant part of the PaMs in Ukraine is deferred to the regional level. The ERT noted that Ukraine provided in its NC6 limited information on PaMs at the national and subnational/regional levels. In the NC6, Ukraine has included a detailed description of one regional programme in Poltava. The programme included a number of energy efficiency measures in the public, utilities, industry and agriculture sectors, with specific quantitative objectives such as reduction of excess energy consumption by the public sector, reducing the share of the energy cost in the structure of the costs of the utilities, etc. As a result of the programme, a large number of boilers have been replaced by more energy-efficient ones, which contributed to a reduction in emissions of about 1.4 kt CO_2 eq. During the review, Ukraine provided the ERT with a list of over 25 regional programmes. The ERT encourages Ukraine to enhance the transparency of its reporting by including more detailed information about the existing regional programmes in its next NC.

51. Table 4 provides a summary of the reported information on the PaMs of Ukraine.

Table 4
Summary of information on policies and measures reported by Ukraine

Sectors affected	*List of key policies and measures*	*Estimate of mitigation impact (kt CO_2 eq)*[a]
Policy framework and cross-sectoral measures		
	Projects under the green investment scheme and joint implementation[b]	10 (in 2012) 120 (in 2020)
	Sector energy efficiency and conservation programme for the period to 2017	7 000 (in 2012) 19 000 (in 2020)
	State target economic programme for energy efficiency and development of production of energy from renewable energy and sources and alternative fuels	19 000 (in 2012) 50 000 (in 2020)
	Poltava region programme	NE
	Multiple other regional programmes	NE
Energy		
Renewable energy	National action plan for renewable energy for the period up to 2020	NE
	Law 'On Fundamentals (strategy) of the State Environmental Policy of Ukraine until 2020'	NE
	Law 'On Electric Power Industry': the 'green tariff' for renewable electricity projects	NE
	Tax and customs codes for Ukraine: reduction of land tax/income tax for businesses in renewable energy	NE
Energy efficiency	Energy strategy of Ukraine until 2030	NE
	Law 'On Fundamentals (strategy) of the State Environmental Policy of Ukraine until 2020'	NE
	National action plan 2020 for energy efficiency	NE
Industrial sectors	Environmental tax on CO_2 emissions: UAH 0.22/t CO_2 (approximately EUR 0.022) in 2011 UAH 0.26/t CO_2 (approximately EUR 0.016) in 2014	NE
	Industry energy efficiency programme in agriculture	NE
	Industry energy efficiency programme for companies, institutions and establishments of the State Agency of the Forest Resources	NE

Sectors affected	*List of key policies and measures*	*Estimate of mitigation impact (kt CO_2 eq)*[a]
	(Derzhlisahentstvo)	
	Industry energy efficiency programme in the field of geology and exploration of mineral resources	NE
	Industry energy efficiency programme and energy conservation	NE
	Industry energy efficiency programme of the State Agency of Automobile Roads (Ukravtodor)	NE
Forestry	Law 'On Fundamentals (Strategy) of the State Environmental Policy of Ukraine until 2020'	NE
	Forestry development strategy	NE
	'Forests of Ukraine' programme	NE

Abbreviations: NE = not estimated, UAH = hryvnia.

[a] Estimates of mitigation impacts are only included in the first biennial report, and not in the sixth national communication.

[b] Estimates of mitigation impacts only include impacts from projects under the green investment scheme.

3. Policies and measures in the energy sector

52. Between 1990 and 2012, GHG emissions from the energy sector decreased by 58.8 per cent (441,267.33 kt CO_2 eq), mainly owing to the strong decline in the economy of the country as a result of conversion from a planned economy to a market economy (over the same period, GDP decreased by 30.3 per cent). The ERT noted that the trend in GHG emissions from fuel combustion showed notable decreases in general, and in the energy industries (56.2 per cent or 152,893.12 kt CO_2 eq) and manufacturing industries and construction (67.0 per cent or 130,211.37 kt CO_2 eq) in particular. The NC6 does not provide information on the impacts of the individual PaMs for the period 1990–2012. The ERT encourages Ukraine to provide such information in future NC submissions.

53. ***Energy supply***. Given that Ukraine's main objective is to reduce its dependence on foreign energy supply, some policies are aimed at increasing the production and use of coal, as well as increasing the domestic production of natural gas. For example, during the review, information was provided about the national energy strategy to 2030, which has as one of its objectives elimination of natural gas import dependency through substantial increase in domestic gas production (shale gas, coalbed CH_4 and coal gasification). Given the high energy intensity of coal and shale gas production, this policy will increase the GHG emissions. The NC6 stays mute on how and by how much these policies will increase the GHG emissions. According to the information on projections provided during the review, the energy intensity of the Ukrainian economy is expected to decrease between 2010 and 2020 from 0.86 to 0.72 toe per thousand USD (2005) of GDP, which is a 16.3 per cent drop from the 2010 level or a 37.4 per cent decrease from the 1990 level; in the historical period between 1990 and 2012, the energy intensity dropped by 30.1 per cent. Information on the shares of renewable energy sources in the projections were not provided, but these shares are likely to decline, as the NC6 contains information highlighting that under the 'with measures' scenario, the amount of coal and peat in the primary energy supply will increase by 41.2 per cent by 2020 and by 85.8 per cent by 2030, the amount of natural gas will increase by 5.8 per cent by 2020 and by 21.7 per cent by 2030, and the amount of refined petroleum products will increase from 23.9 per cent by 2020 and 43.4 per cent by 2030, all compared to the 2010 levels.

54. ***Renewable energy sources***. In the area of renewable energy sources, the NC6 listed a few cross-cutting policies that relate to the use of renewable energy sources such as the law 'On Fundamentals (Strategy) of the State Environmental Policy of Ukraine until 2020',

but during the review, the ERT received much more information and details about the PaMs in the renewable energy sector, which include:

(a) The law 'On Fundamentals (Strategy) of the State Environmental Policy of Ukraine until 2020', with a target of increasing the use of energy sources with low CO_2 emissions by 10.0 per cent by 2015, and by 20.0 per cent by 2020 compared to the 2010 level;

(b) The law of Ukraine of 20 November 2012 no. 5485-17, amending the previous law of Ukraine 'On Electricity' to stimulate the production of electricity from alternative energy sources, establishing 'green tariffs', which are feed-in tariffs for electricity generated at the power plants with alternative energy. The NC6 provides information on the various levels of tariffs for electricity; however, no quantitative targets for this law are available;

(c) The national action plan for renewable energy for the period up to 2020, which includes a large number of measures aimed at increasing the generation of electricity from renewable sources such as solar, wind, bioenergy and geothermal energy. The potential capacities of the new generation plants was provided during the review; however, no specific quantifiable targets were available for this policy;

(d) The tax and customs codes of Ukraine, which provide for a reduction of land tax/income tax for businesses that generate renewable energy.

55. ***Energy efficiency***. Ukraine provided information regarding its PaMs in the area of energy efficiency. They include four main policies:

(a) The law 'On Fundamentals (Strategy) of the State Environmental Policy of Ukraine until 2020', establishing the following targets on energy efficiency: improving energy efficiency by 25.0 per cent by 2015 and by 50.0 per cent by 2020 compared to the 2010 level;

(b) The energy strategy until 2030, which establishes national goals and objectives in energy conservation and energy efficiency. Among the general descriptive objectives of the strategy, a quantitative target was also provided in the NC6, including a reduction in the energy consumption by 30.0–35.0 per cent by 2030 compared to the 2010 level;

(c) The national action plan 2020 for energy efficiency for the period up to 2020, which includes a large number of measures aiming at increasing the energy efficiency in all sectors of the economy, including the industry, transport, and residential and commercial sectors. Estimates of energy savings were provided for each of the initiatives under the national action plan for energy efficiency during the review week;

(d) The state target economic programme for energy efficiency and development of production of energy from renewable energy and sources and alternative fuels. No information was provided on the specific targets of this policy. The BR1 provides an emission estimate of 7,000 kt CO_2 eq by 2012 and 19,000 kt CO_2 eq by 2020 from this policy.

56. ***Residential and commercial sectors***. In its NC6, Ukraine has not identified any PaMs that apply specifically to the residential and commercial sectors. However, the ERT noted that several cross-cutting policies would apply to the residential and commercial sectors, including regional programmes such as the Poltava region programme, which comes under the umbrella of the state target economic programme for energy efficiency, as well as the reconstruction of centralized heating systems in various regions of Ukraine, which comes under the umbrella of the national action plan 2020 for energy efficiency. The ERT encourages Ukraine to include the emission estimates of reductions from the

residential and commercial sectors as a result of the policies, including the cross-cutting policies.

57. ***Transport sector***. In its NC6, Ukraine has not identified any PaMs that apply specifically to the transport sector. During the review, additional information and documents on the PaMs for this sector were provided to the ERT, which included a number of policies under the national action plan 2020 for energy efficiency, aiming at increasing the energy efficiency in the rail, aviation and marine transportation. Estimates of energy savings were provided for each of the initiatives during the review; however, specific targets have not been provided. During the review, the ERT received information regarding the policies on use of biofuels in the transportation sector. Ukraine has a law, 'On Amendments to Some Laws of Ukraine Regarding the Production and Use of Motor Fuels Containing Bio-components', that introduced a mandatory content of ethanol in gasoline produced an for sold in Ukraine. However, during the review, the ERT learned that the law required production of 250 kt bioethanol per year, but at the time of the review, Ukraine was able to produce only 50 kt. During the review, it was mentioned that this policy is not expected to result in any meaningful emission reductions due to the high costs and high energy intensity of producing these biofuels in the country.

58. ***Industrial sector***. In its NC6, Ukraine has not identified any PaMs that apply specifically to the industrial sector. One of the policies that was included for the industrial sectors in the NC6 was environmental tax. During the review, additional information and documents on the PaMs for this sector were provided to the ERT, including a number of energy efficiency policies in the industrial sector. The ERT noted the following main PaMs for the sector:

(a) Environmental tax on CO_2, CH_4 and N_2O emissions of enterprises. The tax rates are different for different gases. The newly introduced tax on CO_2 was at a rate of hryvnia (UAH) 0. 22 in 2011, increasing to UAH 0.26 in 2014. The tax rates for CH_4 and N_2O that existed prior to the CO_2 tax also increased over time, and are significantly higher: growing from UAH 0.6–0.7/t CO_2 eq in 2007 to UAH 3.8–4.6/t CO_2 eq in 2014. No information was provided on the specific targets of this policy;

(b) A series of programmes for various industrial sectors and individual enterprises includes: the industry energy efficiency programme in agriculture; the industry energy efficiency programme for companies, institutions and establishments of the State Agency of the Forest Resources (Derzhlisahentstvo); the industry energy efficiency programme in the field of geology and exploration of mineral resources; the industry energy efficiency programme and energy conservation; and the industry efficiency programme energy State Agency of the Automobile Roads (Ukravtodor). No information was provided on the specific targets of these measures.

4. Policies and measures in other sectors

59. Between 1990 and 2012, GHG emissions from the industrial processes (including solvent and other product use), agriculture and waste sectors decreased collectively by 51.8 per cent (100,419.37 kt CO_2 eq), mainly owing to the strong decline of the economy of Ukraine as a result of transition from a central planned economy to a market economy.

60. ***Industrial processes***. Between 1990 and 2012, GHG emissions from the industrial processes sector decreased by 42.4 per cent (33,832.98 kt CO_2 eq), mainly owing to the decline of the economy, in particular, the decline in the metal production sector, which was responsible for about 55 per cent of emissions in this category (production of iron and steel dropped by about 37 per cent between 1990 and 2012). Ukraine has not reported in its NC6 on any PaMs that would reduce emissions from the industrial processes sector.

61. ***Agriculture***. Between 1990 and 2012, GHG emissions from the agriculture sector decreased by 65.2 per cent (67,569.34 kt CO_2 eq), mainly owing to the decline in the economy, in particular, a dramatic decline in the number of livestock cattle (decreased by 81.8 per cent), swine (decreased by 62.0 per cent) and sheep (decreased by 86.8 per cent).

62. In its NC6, Ukraine has not reported on any PaMs that would reduce emissions in the agriculture sector; however, during the review, Ukraine informed the ERT on policies on collection of biogas from systems of manure management, as well as on increasing the use of the no-till technology in crop production. The ERT encourages Ukraine to provide full information for this sector in its next NC.

63. ***LULUCF***. The LULUCF sector was a net removal of 27,240.83 kt CO_2 eq in Ukraine in 2012, and the net GHG removal has decreased by 60.9 per cent or 42,496.27 kt CO_2 eq since 1990. While forest land is the biggest contributor of removals to the LULUCF sector, it remained relatively stable over the period 1990–2012. Significant variation in cropland is the source of the overall variation in the LULUCF sector. In 1990, cropland was responsible for a net removal of 13,191.96 kt CO_2 eq, then it gradually became a net source rather than a net removal, and by 2012, it became a net source of 32,563.92 kt CO_2 eq.

64. The ERT noted that the BR1 references a forestry development strategy that is defined in the framework for reform and development of the forestry sector, as well as a state programme 'Forests of Ukraine' for the years 2010–2015, which provide for strengthening the environmental, social and economic functions of forests. However, no details were provided about the strategy or the programme. During the review, Ukraine informed the ERT that the law 'On Fundamentals (Strategy) of the State Environmental Policy of Ukraine until 2020' has, among others, the objective of increasing the wooded areas on the territory of Ukraine through reforestation and afforestation; however, no quantitative targets were provided. The ERT encourages Ukraine to provide this information in its next NC.

65. ***Waste management***. The only sector where emissions increased between 1990 and 2012 is the waste sector, where GHG emissions increased by 7.7 per cent (811.20 kt CO_2 eq), mainly driven by an increase in the amount of consumption of food and products per capita and packaging and subsequent landfilling.

66. In its NC6, Ukraine has not reported on any PaMs that would reduce emissions in the waste sector; however, during the review, Ukraine informed the ERT that there is a new policy that requires all the new landfill sites to utilize the CH_4 recovered for the purposes of electricity generation. There are also policies in the food industry targeted at capturing the CH_4 from organic waste associated with the production of sugar, sunflower oil and beer. The ERT encourages Ukraine to provide this detailed information in its next NC.

5. Policies and measures related to implementation of commitments under the Kyoto Protocol

67. Ukraine reported on its package of PaMs adopted, implemented and planned in achieving its commitment under the Kyoto Protocol. The ERT noted that even without the use of any additional PaMs or the use of the Kyoto Protocol mechanisms, Ukraine is very likely to meet its target for the first commitment period under the Kyoto Protocol. Nevertheless, Ukraine is hosting a number of JI projects (see paras. 68 and 94 below).

68. During the review, Ukraine provided information on a great number of JI projects implemented in the country. Ukraine is the country that hosts most of the JI projects in the world. At the end of February 2013, Ukraine's contribution to the world holding of assigned amount units was 54.3 per cent. Many interesting large-scale projects in Ukraine have happened and are being planned under the JI mechanism, in the majority of the sectors

of the Ukrainian economy. During the review, Ukraine informed the ERT that the future of these projects is not very clear, given the domestic uncertainties.

69. In its NC6, Ukraine has not reported in a transparent manner on its Kyoto Protocol targets for either the first or the second commitment period of the Kyoto Protocol and the PaMs that it has in place to meet these targets. The only reference to the Kyoto Protocol targets in the NC6 was made in one chart, which was unclear. During the review, Ukraine provided additional information, elaborating on its Kyoto Protocol target for the second commitment period and the PaMs that it has in place to meet this target. The ERT notes that Ukraine could improve the clarity of its reporting by providing specific information on its Kyoto Protocol target for the second commitment period in the next NC.

70. In the addendum to the NC6 submitted on 28 October 2014, Ukraine included some information on how it promotes and implements the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) decisions to limit emissions from aviation and marine bunker fuels. During the review, Ukraine clarified that according to the Association Agreement, Ukraine will be implementing policies targeting reduction of emissions from international transportation, including aviation and marine bunker fuels. The ERT recommends that Ukraine consolidate and better reflect this information in its next NC submission.

71. In the addendum to the NC6, Ukraine reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and the effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties. The ERT encourages Ukraine to further reflect this information in its next NC submission.

72. The addendum to the NC6 underlines two programmes related to this matter: the national programme for protection of population and the territories from the emergency situations from natural disasters for 2013–2017 and the national programme for water development and ecological rehabilitation of the Dnieper River Basin for the period until 2021, which include a number of measures to overcome the consequences of climate change in adjacent countries, such as Belarus and Republic of Moldova. The information provided in the addendum to the NC6 also reported on a project on climate change and security in the Dniester River Basin that is being developed by the Organisation for Economic Co-operation and Development and supported by the Government of Austria and by the European Commission, which will increase the adaptation potential of Ukraine and Republic of Moldova by improving trans-border cooperation.

73. Further information on how Ukraine strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2014 annual submission, is presented in chapter III.B below.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

74. In its NC6, Ukraine has reported on three emission projection scenarios. The 'with measures', 'with additional measures' and 'without measures' scenarios until 2030 were produced by the General Energy Institute of the National Academy of Sciences of Ukraine according to a contract with SEIA.

I. Projections overview, methodology and key assumptions

75. The GHG emission projections provided by Ukraine in its NC6 include a 'with measures', a 'with additional measures' and a 'without measures' scenario until 2030, presented relative to actual inventory data for 1990–2011. Projections are presented on the Intergovernmental Panel on Climate Change (IPCC) sectoral basis, using the same sectoral categories used in the PaMs section in the NC6 and on a gas-by-gas basis for all the following GHGs: CO_2, CH_4, N_2O, HFCs and SF_6 (treating HFCs collectively in each case). Projections are also provided in an aggregated format for each sector, as well as for a national total, using global warming potential values.

76. The ERT noted that numerical values of projections of PFC emissions were not provided in the NC6, instead, the notation keys "IE", "NA" and "NO" starting from 2011 were reported. The ERT also noted that the NC6 does not include information required by the UNFCCC reporting guidelines on NCs on fuel sold to ships and aircraft engaged in international transport. The ERT recommends that Ukraine report emission projections on PFC emissions, as well as on fuel sold to ships and aircraft engaged in international transport, to the extent possible, separately and not included in the totals. The ERT further noted that Ukraine did not provide projections for the following indirect GHGs in its NC6: carbon monoxide, nitrogen oxides, non-CH_4 volatile organic compounds and sulphur oxides. The ERT encourages Ukraine to provide this information in its next NC.

77. The ERT noted that in NC6 tables 5.1, 5.3–5.6, 5.8–5.10, 5.12–5.14, 5.16–5.18 and corresponding common tabular format (CTF) tables 6 on projections, there were some inaccuracies and inconsistencies.

78. During the review, Ukraine provided a revised chapter 5 of the NC6 with corrected values in tables on projections and particularly tables 5.16–5.18 of the NC6, corresponding to CTF tables 6. The ERT recommends that Ukraine ensure that quality control procedures are in place so that accurate, consistent and complete data on projections are included in its next NC.

79. The 'with measures' scenario is defined in the NC6 as that scenario which includes PaMs defined in the policy documents elaborated by the Government of Ukraine before 2012. The 'with additional measures' scenario is defined as covering the emission reduction potential, which might be achieved with some additional support, but this support is not yet planned. The ERT noted that this definition does not fully comply with the definitions set out in the UNFCCC guidelines on NCs, which refer to inclusion of planned PaMs that are options under discussion and having a realistic chance of being adopted and implemented in the future. The ERT noted that the 'without measures' scenario does not include PaMs as of 2011. The ERT recommends that Ukraine adhere to the scenario definitions set out in the UNFCCC reporting guidelines on NCs and report projections accordingly in its next NC.

80. Ukraine reported on the changes to the methodology compared to the NC5. Ukraine reported on the methodology used to generate GHG emission projections with an emphasis on the energy sector. Economic development scenarios were generated and corresponding GHG emissions were calculated using a system of mathematical models with optimization criteria to maximize the GDP at given constraints. Initially, the model system was developed for coordinated macroeconomic and energy development, and later, other sectors were added to allow calculation of their emissions in the projections. The ERT noted that 2010 was chosen as the base year for the analysis. The changes to the methodology resulted in improvements in the accuracy of projections, as emissions were calculated in the same modelling framework using the same set of assumptions. During the review, Ukraine's modelling expert pointed out that the forecasts reported in the NC5 were based on very optimistic economic development assumptions, which resulted in high growths of

emissions. The ERT also noted that the approaches used for calculating the projections of GHG emissions for the industrial processes, agriculture, LULUCF and waste sectors in the overall modelling framework were not clearly reported on in the NC6. The ERT encourages Ukraine to improve the transparency of its reporting by including additional information on the methodology and approaches used for calculating the projections of GHG emissions in its next NC.

81. Ukraine reported some of the key underlying assumptions and some key variables such as GDP growth and fossil fuel consumption in the NC6. However, information on all other key underlying assumptions, key variables and relevant information on factors and activity for each sector (e.g. international fuel prices, primary energy consumption by fuel, share of renewable in total primary energy supply, etc.) was not adequately presented in the NC6. The ERT encourages Ukraine to report information about key underlying assumptions and values of variables, and recommends that Ukraine present relevant information on factors and activities for each sector, if possible, in tabular format in its next NC.

82. In its NC6, Ukraine supplemented the results for the 'with measures' scenario with two additional sensitivity scenarios, where the challenges facing the Ukrainian economy were overcome faster (optimistic scenario) and slower (pessimistic scenario) than in the baseline scenario. These scenarios are showing the economic growth of the country in the long term and are based on the general trends of sectoral development, as well as on the approaches to managing the economy of the country. The main difference between these scenarios is the different time frame to meet the challenges of development and growth of the economy and the pace of development of individual sectors, which in the case of the optimistic scenario are shorter than in the baseline and the pessimistic scenarios. Therefore the baseline scenario reflects the most likely scenario of economic development based on the only realistic opportunity for sustainable economic development in Ukraine and is the basis for generating the 'with measures' scenario.

2. Results of projections

83. Ukraine's target under the Kyoto Protocol is, on average, 920,836.93 kt CO_2 eq per year during the first commitment period (2008–2012), which is equivalent to stabilization of GHG emissions at the base year level or 100.0 per cent of this level. According to the GHG inventory data in the 2014 annual submission, average annual emissions during 2008–2012 were 399,886.85 kt CO_2 eq (56.6 per cent below the target), indicating that Ukraine is on track to overachieve its target using domestic efforts alone. As such, Ukraine does not need to use the Kyoto Protocol mechanisms and the accounting for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. Nevertheless, Ukraine is hosting a number of JI projects (see para. 68 above and para. 94 below).

84. For the second commitment period of the Kyoto Protocol (2013–2020), Ukraine has committed to achieve a target of GHG emission reduction by 24.0 per cent below the base year (1990) level, equivalent to an average of 717,708.01 kt CO_2 eq per year based on the 2014 annual submission. Under the Convention, Ukraine made a commitment to reducing its GHG emissions by 20.0 per cent by 2020 below the 1990 level, equivalent to 755,482.11 kt CO_2 eq based on the 2014 annual submission.

85. Overall, Ukraine's reported projections of total GHG emissions for 2020 and 2030 show an increasing emission trend. The drivers underlying the projected increase of emissions are: the projected long-term development trends of the national economy, including an increase in production in the energy intensive industry sectors; improvement of population life standards; development of the agricultural sector; and an increase of domestic coal and natural gas mining. Based on the revised projection results provided during the review, the projected reduction in GHG emissions under the 'with measures' and

'with additional measures' scenarios, in 2020 in relation to 1990, are 51.4 and 52.2 per cent, respectively. The projected emission reductions under the 'with measures' and 'with additional measures' scenarios by 2030 are 42.6 and 44.9 per cent, respectively, compared to the 1990 levels. The projected emission reductions under the 'without measures' scenario by 2020 and 2030 are 46.0 and 15.3 per cent, respectively, compared to the 1990 levels. Taking this into account, it is likely that Ukraine will be able to meet its targets under the second commitment period of the Kyoto Protocol and under the Convention and that it would not need to use market-based mechanisms and accounting for LULUCF activities for achieving these targets.

86. The contributions of different gases to Ukraine's total GHG emission projections of 459,161.36 kt CO_2 eq in 2020, for the 'with measures' scenario are as follows: CO_2, CH_4 and N_2O emissions of 351,922.06, 67,857.21 and 38,657.37 kt CO_2 eq, respectively. This represents an increase in CO_2, CH_4 and N_2O emissions of 15.6, 2.6 and 23.2 per cent, respectively, by 2020 compared with the 2012 levels. In the same scenario, the total GHG emissions are projected to be 541,907.26 kt CO_2 eq in 2030, including CO_2, CH_4 and N_2O emissions of 424,669.04, 77,641.62 and 39,041.08 kt CO_2 eq, respectively. The projected emissions of F-gases in 2020 and 2030 in the 'with measures' scenario are small (724.36 kt CO_2 eq and 555.26 kt CO_2 eq, respectively).

87. The contributions of the largest sectors to total projected emissions for the 'with measures' scenario in 2020 are as follows: energy (without transport), 293,876.00 kt CO_2 eq; transport, 40,210.00 kt CO_2 eq; industrial processes, 72,610.36 kt CO_2 eq; agriculture, 43,100.00 kt CO_2 eq; and waste, 9,000.00 kt CO_2 eq. This represents an increase in energy (without transport), transport, industrial processes and agriculture emissions of 6.6, 20.1, 57.8 and 19.6 per cent, respectively, by 2020 compared to the 2012 levels and of 35.1, 52.2, 48.4 and 21.6 per cent, respectively, by 2030 compared to the 2012 levels. In the 'with measures' scenario, the projected share of the energy sector in the total emissions decreased from 76.8 per cent in 2012 to 72.8 per cent in 2020, and then increased to 78.1 per cent in 2030, while the projected share of the industrial processes sector in the total emissions increased from 11.4 per cent in 2012 to 15.8 per cent in 2020, and then decreased to 12.6 per cent in 2030. The other sectors' contributions to the national totals in these years are minor and will remain stable. The only sector whose emissions are decreasing compared with 2012 is the waste sector with 20.8 per cent and 47.2 per cent decreases in 2020 and 2030, respectively.

88. During the review, Ukraine did not present updated emission projections in its revised chapter 5 of the NC6, but considering the country's crisis in 2014 on the one hand and the signed Association Agreement on the other hand, it is probable that future emission levels would change significantly. In particular, through the implementation of the EU directives related to mitigation actions and potential participation in emissions trading, would be possible for Ukraine to achieve further reductions in emissions, while maintaining projected economic growth, of course taking into account the significant impact of the 2014 crisis in the country's economic development in the near and midterm future.

89. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and quantified economy-wide emission reduction target are presented in table 5 and the figure.

Table 5
Summary of greenhouse gas emission projections for Ukraine

	Greenhouse gas emissions (kt CO_2 eq per year)	Changes in relation to the base year[a] level (%)	Changes in relation to the 1990 level (%)
Kyoto Protocol base year[b]	920 836.93	NA	−2.5
Kyoto Protocol target for the first commitment period (2008–2012)	920 836.93	0.0	−2.5
Kyoto Protocol target for the second commitment period (2013–2020)	717 708.01	−24.0	−24.0
Quantified economy-wide emission reduction target under the Convention	755 482.11	−20.0	−20.0
Inventory data 1990[c]	944 352.64	2.6	NA
Inventory data 2012[c]	402 665.95	−56.3	−57.4
Average annual emissions for 2008–2012[c]	399 886.85	−56.6	−57.7
'Without measures' projections for 2020[d]	509 642.00	−46.0	−46.0
'With measures' projections for 2020[d]	459 161.36	−51.4	−51.4
'With additional measures' projections for 2020[d]	451 659.96	−52.2	−52.2
'Without measures' projections for 2030[d]	800 101.00	−15.3	−15.3
'With measures' projections for 2030[d]	541 907.26	−42.6	−42.6
'With additional measures' projections for 2030[d]	519 872.06	−44.9	−44.9

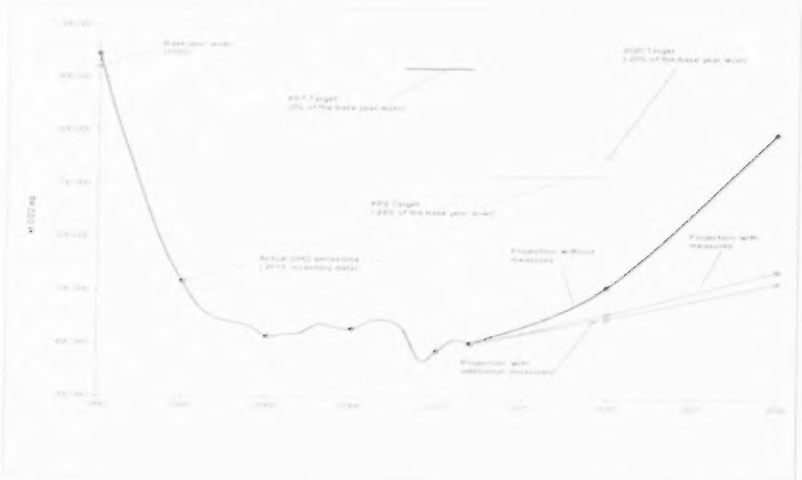
[a] 'Base year' in this column refers to the base year used for the targets under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base year level of emissions is provided in the initial review report contained in document FCCC/IRR/2007/UKR.

[c] Ukraine's 2014 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry (LULUCF).

[d] Revised projections provided by the Party during the in-depth review; the projections are for greenhouse gas emissions without LULUCF.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2012: Ukraine's 2014 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry. (2) Data for the years 2012–2030: Revised projections provided by the Party during the in-depth review; the emissions are without land use, land-use change and forestry.

Note: The target for the second commitment period of the Kyoto Protocol and the quantified emission limitation or reduction objective included in annex I to decision 1/CMP.8 are based on estimates of the base year emissions reported in the 2014 greenhouse gas inventory submission. The initial assigned amount for the second commitment period will be established after the initial review for the second commitment period of the Kyoto Protocol.

Abbreviations: GHG = greenhouse gas, KP1 = first commitment period of the Kyoto Protocol, KP2 = second commitment period of the Kyoto Protocol.

3. Total effect of policies and measures

90. In the NC6, Ukraine did not present the estimated and expected total effect of implemented and adopted PaMs and an estimate of the total effect of its PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs. It also does not present relevant information on factors and activities for each sector for the years 1990–2030.

91. The ERT recommends Ukraine to provide quantitative estimates of the estimated and expected total effect of its implemented and adopted PaMs on emissions aggregated at the sectoral and national levels in accordance with the 'with measures' definition, compared with a situation without such PaMs presented in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis), in its next NC.

92. The ERT calculated that the total estimated effects of adopted and implemented PaMs are 61,743.68 and 275,141.12 kt CO_2 eq by 2020 and 2030, respectively. According to the information reported in the NC6, PaMs implemented in the energy sector (excluding transport) will deliver the largest emission reductions, followed by the effect of PaMs implemented in the transport sector by 2020 and 2030 and in the industrial processes sector by 2030. The ERT noted the negative impacts of PaMs for the industrial processes sector in 2020, as the emission projections for this sector are higher in the 'with measures' and 'with additional measures' scenarios than in the 'without measures' scenario (see table 6 below). The ERT noted that no explanation is provided in the NC6. The ERT encourages Ukraine to include information on the negative impacts of PaMs for the industrial processes sector in 2020 in its next NC. The most effective PaMs and drivers behind GHG emission reductions are described in chapter II.B above. Table 6 provides an overview of the total effect of PaMs calculated by the ERT based on information in Ukraine's NC6.

Table 6
Projected effects of planned, implemented and adopted policies and measures in 2020 and 2030

Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*
	2020				*2030*			
Energy (without transport)	39 730.00	5.9	4 500.83	0.7	151 320.00	22.3	15 424.64	2.3
Transport	13 024.00	17.9	3 000.57	4.1	32 613.00	44.7	6 610.56	9.1
Industrial processes	–7 412.36	–9.3	0	0.0	40 273.74	50.4	0	0.0
Agriculture	2 795.00	2.7	0	0.0	28 252.00	27.3	0	0.0

Sector	Effect of implemented and adopted measures ($kt CO_2 eq$)	Relative value (% of 1990 emissions)	Effect of planned measures ($kt CO_2 eq$)	Relative value (% of 1990 emissions)	Effect of implemented and adopted measures ($kt CO_2 eq$)	Relative value (% of 1990 emissions)	Effect of planned measures ($kt CO_2 eq$)	Relative value (% of 1990 emissions)
	2020				2030			
Land-use change and forestry[a]	11 340.00	16.3	0	0.0	17 190.00	24.6	0	0.0
Waste management	2 267.04	21.5	0	0.0	5 492.38	52.0	0	0.0
Total	**61 743.68**	**6.5**	**7 501.40**	**0.8**	**275 141.12**	**29.1**	**22 035.20**	**2.3**

Source: Ukraine's sixth national communication and first biennial report.

Note: The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios, the total effect of planned policies and measures is defined as the difference between the 'with measures' and 'with additional measures' scenarios.

[a] In the 'without measures' scenario of the sixth national communication, it is assumed that the growth of emissions from land use activities will be fully offset by sinks.

4. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

93. Ukraine in its NC6 provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. The ERT noted that Ukraine does not need to use the market-based mechanisms to meet its Kyoto Protocol target (see para. 85 above).

94. Ukraine participates in two Kyoto Protocol mechanisms (JI and international emissions trading), as well as in two projects under the clean development mechanism. During the review, Ukraine provided essential information on JI projects that it hosts. As of 20 October 2014, letters of endorsement had been issued to 440 JI projects, letters of approval had been issued to 304 JI projects, 278 projects had been registered with the UNFCCC secretariat and 503,330,006 emission reduction units (ERUs) had been issued. The shares of the energy and industrial processes sectors in the total ERUs issued were 49 per cent and 43 per cent, respectively. Ukraine has set up GIS (see paras. 30 and 31 above) that is funded from the revenue from the international emissions trading of the assigned amount units and aims at funding projects related to GHG emission reductions. Up to 18 July 2014, SEIA had registered 817 projects.[9] During the review, Ukraine informed the ERT that according to monitoring information carried out by third-party auditors for 2013, the total achieved emission reductions of the audited 155 projects was 14.04 kt CO_2 eq per year.

D. Provision of financial resources and technology transfer to developing country Parties

1. Financial resources, including "new and additional" resources and resources under Article 11 of the Kyoto Protocol

95. In its NC6, Ukraine provided information on provision of support required under the Convention and its Kyoto Protocol. Ukraine indicated that as a Party included in Annex I to the Convention, but not included in Annex II, it has no financial obligations, and it did not provide financial resources pursuant to Article 4, paragraphs 3, 4 and 5, of the Convention, as well as support and financial resources to developing countries under Article 11 of the

[9] Available at <http://www.seia.gov.ua/seia/control/main/uk/publish/article/638035>.

Kyoto Protocol, including "new and additional" resources. Ukraine did not make any financial contributions to the Global Environmental Facility, multilateral institutions and programmes, or bilateral and regional financial contributions related to the implementation of the Convention.

96. However, on a voluntary basis, Ukraine, during previous years (1999–2009), provided financial support to overcome the consequences of extreme weather conditions, natural disasters and earthquakes in the following countries: Brazil, China, Cuba, Ethiopia, Kyrgyzstan, Pakistan, Republic of Moldova, Tajikistan and Turkey. Because of the difficult economic situation in the country, since 2010, Ukraine has had no financial resources to provide support for developing countries or countries suffering from natural disasters. The ERT encourages Ukraine to include information, if any, on this topic in its next NC, as well as on the provision of any financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels.

2. Technology transfer, including information under Article 10 of the Kyoto Protocol

97. Ukraine has provided in its NC6 summary information on activities related to the transfer of technology and support to developing countries in accordance with Article 4 of the Convention and under Article 10 of the Kyoto Protocol.

98. The NC6 contains information on the national action plan of Ukraine for the implementation of the Kyoto Protocol adopted by resolution of the Cabinet of Ministers of Ukraine no. 272-p of 5 March 2009, stipulating the establishment of a database of environmentally sound technologies and practices. The ERT noted that this database has not yet been established because of lack of funding.

99. During the review, the ERT was informed that Ukraine has the intention to establish the database of environmentally sound technologies and practices, taking into account the United Nations Economic Commission for Europe environmental indicators. A new resolution of the Cabinet of Ministers of Ukraine is being prepared in this regard. The database will be established and become available for national and international stakeholders, including developing country Parties, on a dedicated website within two to three years.

100. In the addendum to its NC6, submitted on 28 October 2014, Ukraine included information on activities of Ukrainian companies in the technology transfer of alternative energy resources and their use, for example, biofuels. These companies develop projects and construct biogas power stations in Indonesia, Lithuania, Republic of Moldova, Russian Federation, Slovakia and Turkey, including two important projects under the clean development mechanism of the Kyoto Protocol in Republic of Moldova.

101. Ukraine has provided limited information on its activities, actions and programmes undertaken in fulfilment of its commitments under Article 10 of the Kyoto Protocol, namely, steps taken to cooperate in the promotion of transfer of know-how practices to developing countries. In the addendum to its NC6 and during the review, Ukraine provided information on actions to support capacity-building of developing countries through education of students from these countries in Ukraine. Students from developing countries, including Armenia, Azerbaijan, China, Iraq, Kazakhstan, Kuwait, Republic of Moldova, Syrian Arab Republic and Turkmenistan have studied and graduated in climate-related courses, at Ukrainian universities during the period 2010–2014. These courses have covered hydrometeorology and meteorology, climatology, ecology, energy efficiency and economics of natural resources. The ERT recommends that Ukraine enhance the transparency and completeness of the information provided in the NC on its activities and actions, including planned activities, undertaken in fulfilment of its commitments under Article 10 of the Kyoto Protocol, and include in its next NC updated and complete

information concerning the steps it has taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention in order to facilitate the implementation of Article 10 of the Kyoto Protocol.

E. Vulnerability assessment, climate change impacts and adaptation measures

102. In its NC6, Ukraine has provided the required information on the expected impacts of climate change in the country and on adaptation options.

103. Table 7 summarizes the information on vulnerability and adaptation to climate change presented in the NC6.

Table 7
Summary of information on vulnerability and adaptation to climate change

Vulnerable area	*Examples/comments/adaptation measures reported*
Agriculture, food security and fisheries	Vulnerability: present and projected changes in temperatures and precipitation are expected to increase the risks for crop production, soil fertility, quality of products and fisheries
	Adaptation: spatial assessment of favourability of future climate conditions for production of cereal crops and forest plantations; selection of plant breeding; review of distribution of specialized seed zones due to changes in climatic conditions; optimal timing of major technological activities in crop growing; maintaining selection in livestock, poultry and fisheries; promoting wide implementation of risk insurance in agriculture; and reconstruction of physical infrastructure of irrigation and drainage systems
Biodiversity and natural ecosystems	*Vulnerability*: changes in temperature and precipitation regimes, both present and projected, are indicating the possibility of shifting geographical areas for populations of various species to the north, and/or extinction
	Adaptation: no adaptation measures were implemented or planned in this area directly; the measures may be considered under other adaptation activities for other areas
Coastal zones	*Vulnerability*: sea level rise, as well as temperature and precipitation regime changes, may increase vulnerability of coastal areas in the Black and Azov Seas
	Adaptation: research of direction and intensity of erosion processes in the coastal zones of the Black and Azov Seas relating to climate change conducted; construction, reconstruction and maintenance of hydraulic and coast-protection structures, flood control reservoirs, dikes, polders and contour-reclamation systems; and afforestation of coastal shelterbelts and implementation of erosion control measures
Drought	*Vulnerability*: projections of temperature and precipitation changes indicate increasing vulnerability of some areas in Ukraine, particularly in semi-arid areas prone to desertification
	Adaptation: spatial analysis of trends in the frequency and intensity of extreme meteorological events on the territory of Ukraine; implementation of national system of monitoring emergency situations associated with natural disasters, extreme and hazardous weather phenomena; and introduction of a set of measures to combat desertification and degradation of lands

Vulnerable area	*Examples/comments/adaptation measures reported*
Forests	*Vulnerability*: changes in temperature and precipitation regimes both present and projected are indicating increasing threat to forests regarding their size, quality and pest infestation
	Adaptation: development of methods for identification of areas of afforestation and reforestation based on geographic information systems and advanced measurement technologies; improvement of climate change projections and assessment of its impacts on forest ecosystems; improvement of technology of forest planting in changing climatic conditions; and revision of forest management standards, depending on climate change projections
Human health	*Vulnerability*: rising temperature and precipitation regime changes impose burdens on human physical and psychological health and life
	Adaptation: study of the impact of climate change on human health and the development of appropriate recommendations for health care; identification of measures to strengthen prevention activities for extreme weather phenomena; study of feeding habits of the population in relation to climate change and forecasting the impact of this change on the health of critical groups; and development of scientific substantiation of safe and effective use of herbicides, insecticides and disinfectants to prevent and combat new pathogens and vectors of disease in humans, animals and plants
Infrastructure, economy and energy	*Vulnerability*: intensifying extreme weather events make infrastructure, including energy production utilities, vulnerable to climate change
	Adaptation: developing measures to ensure the safety of passenger and cargo transportation by air, road, rail, sea, river and urban electric transport in the context of the growing number of incidences and intensity of extreme weather events; study of vulnerability of the energy sector to climate change, including the processes of production of electricity and thermal energy, transmission and consumption of energy resources; study of the vulnerability of the existing energy infrastructure to climate change and identification of adaptation measures at marginal values of indicators of extreme weather events; development of guidelines for assessment of vulnerability of distribution networks and the segments of increased electricity needs (air conditioning and refrigeration) and identification of adaptation measures to increased stress levels; and development of methods for forecasting energy sector development in the medium and long term, taking into account links with other sectors of the economy, particularly in the context of levels and modes of fuel and energy consumption in the present process of climate change
Water resources	*Vulnerability*: risks for flooding and water supply because of lowering average values of river run-off, increases in the quantity and seasonal fluctuations of rainfall, including increases of frequency of extreme rainfall and droughts and increased salinity in rivers and other reservoirs; and changes in water flow, precipitation sums, rainfall intensity, number of flooding days and intensity of floods in different parts of important river basins in Ukraine
	Adaptation: conducting a spatial analysis of water regime changes in surface water bodies in Ukraine; conducting a study of long-term changes in average annual flow based on observations in the basins of the Dnieper, Dniester, Danube, Southern Bug, Western Bug and Seversky Donets Rivers, and rivers in the regions of the Black Sea, the Azov Sea and the Crimea, within the research work of the Hydrological Studies Department at the Ukrainian Hydrometeorological Institute; conducting an investigation of possible future changes (2031–2050) in the water flow of selected 31 river basins, according to four regional climate models, for *Special Report on Emissions Scenarios* (SRES) A1B scenario; conducting a special study of projections of hydrometeorological hazards and extreme weather events in the Dniester River Basin for 2021–2050 on the basis of a regional model by SRES A1B scenario for providing flood protection in the context of intensifying extreme weather events; clearing and regulation of riverbeds and maintenance of favourable hydrological regimes; construction and reconstruction of hydrological stations; creation of automated information measuring systems and introduction of information systems for modelling floods; and elaboration and update of cartographic flood zones

104. Ukraine provided detailed information on studies of climate change impacts and vulnerability of various sectors and ecosystems to climate change in its NC6. The main focus of the NC6 is on vulnerability, as in the NC5. Research studies on projections of climate parameters were described in detail, and an example of the projections of hydrometeorological hazards and extreme weather events in the basin of the Dniester River was provided in detail. For projections of climate parameters over the territory of Ukraine and its regions, the ENSEMBLE of regional climatic models has been selected as the most suitable for the country, based on results of verification with historical data. The conducted research revealed that the tendencies of temperature rise and precipitation decrease in the country will become increasingly severe with the passing of time in this century, although with significant differences between regions. The changes observed and projected in public health, multiple economy sectors and ecosystems, especially water resources, may be reflected in risks to life security, quality of life, and nutrition and deterioration of ecological conditions. The energy complex of Ukraine, agriculture and water supply systems are considered the most vulnerable sectors to climate change.

105. In its NC6, Ukraine provided information on the status of its national adaptation plan (NAP): after preparation of the draft in 2012, it was considered under the national dialogue and the proposals from central and local authorities have been consolidated. However, the draft has not yet been adopted by the Government of Ukraine because of financial considerations. Nevertheless, Ukraine reported in its NC6 on identification of a number of priority adaptation activities from the draft NAP aimed at creation of organizational prerequisites and scientific foundation for implementation of the state policy in adaptation of the most vulnerable sectors of economy, ecosystems and health. According to this simplified plan that was approved by the order of SEIA and agreed with MENR in 2012, several activities have been implemented, such as development of medium- and long-term scenarios of climate change in Ukraine, spatial analysis of water regime changes in surface water bodies and analysis of trends for intensity and frequency of extreme weather events; further measures have been planned, such as enhancing activities for obtaining new knowledge for adaptation measures, formation of regional policy on adaptation and implementation of specific adaptation measures for the health-care and economic sectors. The ERT noted that the adoption by Ukraine of its NAP would enhance its activities in adaptation to climate change. The ERT encourages Ukraine to report on any new developments regarding the adoption of the NAP in its next NC.

106. The ERT noted that Ukraine does not report in its NC6 an outline of the action taken to implement Article 4, paragraph 1(e), of the Convention with regard to adaptation, and in particular on cooperation with other Parties to the Convention in preparing for adaptation to the impacts of climate change. The ERT recommends that Ukraine report on such action in its next NC.

F. Research and systematic observation

107. Ukraine has provided information on its actions relating to research and systematic observation, and addressed both domestic and international activities. However, the ERT noted that the information on its domestic and international activities, in particular, cooperation with Global Climate Observing System (GCOS), the International Geosphere–Biosphere Programme (IGBP), the World Climate Research Programme (WCRP) and the IPCC is limited. Ukraine has provided summary information on its participation under the World Meteorological Organization (WMO) and GCOS activities, especially in the Global Telecommunication System of WMO. Data from 37 meteorological and 9 upper-air stations constantly flows to the Global Telecommunication System of WMO. A number of Ukrainian meteorological stations are included in GCOS. The Hydrometeorological Service

of Ukraine takes part in almost all WMO programmes, particularly the Global Atmosphere Watch, World Weather Watch and Hydrology and Water Resources programmes.

108. According to the NC6, Ukraine has a well-developed network of research institutions that fulfils research and systematic observation. Among these institutions, the most important are: the National Academy of Sciences of Ukraine, the Ukrainian Hydrometeorological Institute (UkrHMI) of the State Service of Ukraine on Emergencies, the UkrHMI Marine Department in Sevastopol, and the state system of national meteorological observations of the Hydrometeorological Service. The Hydrometeorological Service is funded from general and special funds of the state budget under the budget programme hydrometeorological activity. During the period 2009–2011, funding increased year by year, and in 2011, it amounted to UAH 161.1 million (general fund) and UAH 29.2 million (special fund).

109. In its NC6, Ukraine provided summary information on its extensive multilevel comprehensive measuring and information system, the purpose of which is to carry out systematic observations of the atmosphere and water. Climate observations are made on the basis of generalized plans, programmes and tasks, which were developed by the Hydrometeorological Service in accordance with the requirements and recommendations of WMO. The National Climate Observing System includes 187 stations that carry out meteorological observations according to a programme for second category stations and 311 posts for monitoring only atmospheric phenomena, precipitation and snow cover. Monthly climate information with data on temperature and precipitation of monthly and annual variation of meteorological parameters is placed on the Central Geophysical Observatory website.[10]

110. The ERT noted that under the framework of GIS, Ukraine has conducted more than 20 research works aimed at fulfilment of its obligations under the Convention and the Kyoto Protocol, including preparation of national reports, modelling of GHG emission projections, development of adaptation measures, studying impacts of extreme hydrometeorological events, etc. Since the NC5, the legal framework for research and systematic observation in the country has been renewed: the last edition of the law of Ukraine 'On the Scientific and Technical Activities', no. 1977-XII from 1991, was published on 16 October 2012, and the last edition of the law of Ukraine 'On Hydrometeorological Activities', no. 443-XIV from 1999, was published on 16 December 2012. The law of Ukraine 'On the Scientific and Technical Activities' aimed at regulation of scientific and technical activities and the creation of conditions to improve the efficiency of research and use of their results to ensure development in all aspects of public life. The law of Ukraine 'On Hydrometeorological Activities' determines general legal, economic and social organizational principles of the hydrometeorological activities in Ukraine.

111. The ERT noted that information on provision of support to developing countries to establish and maintain observing systems, research and related data and monitoring systems has not been provided in the NC6. During the review, Ukraine informed the ERT that it conducted various projects for installation of meteorological stations in Armenia, Belarus and Republic of Moldova, which were performed by Ukrainian engineers and had the objective of improving the meteorological observations in these countries.

112. The ERT recommends that Ukraine include in its next NC information on actual or planned actions taken to support capacity-building in developing countries in the area of research and systematic observation. The ERT encourages Ukraine to report in its next NC in particular on support for developing countries in establishing and maintaining observing and monitoring systems, such as those indicated in paragraph 111 above. The ERT also recommends that Ukraine provide more complete and transparent information on its

[10] Available at <http://www.cgo.kiev.ua>.

domestic and international activities, in particular, cooperation with GCOS, the IGBP, the WCRP and the IPCC.

G. Education, training and public awareness

113. In the NC6, Ukraine has provided information on its actions relating to education, training and public awareness at both the domestic and international levels. Compared to the NC5, Ukraine provided analogous and updated information on some aspects of education, training and public awareness. The ERT noted that, in some cases, the section on education, training and public awareness in the NC5 was better structured and more informative than the corresponding section in the NC6.

114. State policy in education is determined by the Verkhovna Rada of Ukraine in accordance with the Constitution, the law of Ukraine 'On Education' and other related laws. The Ministry of Education and Science of Ukraine (MES) is the main state executive authority in education. Ukraine has a well-developed system of overall education, including education in environment and climate from primary school level to university level. According to the information in the NC6, more than 100 universities in Ukraine prepare ecologists, as well as specialists in meteorology and climatology. New mandatory climatology and meteorology courses were introduced in Kiev National Taras Shevchenko University, Odessa State Ecological University, the National Environmental Centre for school-age students and many other universities. During the review, Ukraine provided the ERT with a list of specialized disciplines in environmental and climate issues that foreign students from developing country Parties (Armenia, Azerbaijan, China, Iraq, Kazakhstan, Kuwait, Republic of Moldova, Syrian Arab Republic and Turkmenistan) study in Ukrainian universities.

115. During the review, Ukraine provided additional updated data on education, training and public awareness for the period 2010–2014. The ERT learned about a systematic approach to the implementation of the Doha work programme on Article 6 of the Convention (decision 15/CP.18) concerning Ukraine's commitments on education, training and public awareness, which consists of the following steps: appointment of a national focal point on Article 6; development of a high-priority action plan, fully consistent with the Doha work programme guidelines; and creation of a holistic system of education and training in climate change incorporating all age groups and strata of the society. A national focal point on Article 6 has been designated, and a national action plan is being developed. The work, aimed at creation and establishment of a holistic system of education and training in climate change incorporating all age groups and strata of society, has begun, and will take several years up to 2020.

116. In the NC6 and during the review, Ukraine provided information concerning: training on climate change at regional seminars, in particular, on adaptation; scientific and practical conferences and round-table discussions; dissemination of scientific knowledge through regular publications on climate change to the target groups of scientific, technical and managerial personnel, journalists, teachers and community leaders at the local, national, subregional, regional and international levels; and traineeships of Ukrainian specialists abroad (e.g. in Denmark, Germany, Japan, etc.). During the review, additional information was provided to the ERT on training of specialists in the fields of climatology, adaptation and mitigation of climate change, and economics of climate change; information on the training of senior and mid-level specialists from governmental and municipal authorities at the national and regional levels was also provided. Educational and training programmes are implemented in the framework of so-called education and training on climate change; this is a direction of activities that is an integral part of education for sustainable development and the overall education system of Ukraine. Training

programmes are administered and organized by MES and Ukrainian educational institutions. Many training programmes are implemented with the technical support of international organizations and funds. The ERT noted that in the framework of non-formal education and public awareness on climate change and adaptation, NGOs play a significant role.

117. The NC6 also provides information on the following items: information to the public, involving NGOs in the improvement of environmental protection legislation on the basis of the EU Aarhus Centre, providing public access to the official information on implementation of the Convention, social media participation through publications, television and radio programmes dedicated to the problems of climate change, and massive public awareness campaigns and actions with the active involvement of environmental NGOs. During the review, the ERT met with representatives of the NGOs and obtained additional information on their work and cooperation with governmental institutions such as SEIA, and participation of IAC. Representatives of the NGOs expressed their willingness for closer cooperation with governmental institutions and for participation in resolving climate change issues.

118. The NC6 does not contain information on how the public participates in the preparation or domestic review of the NC. However, during the review Ukraine provided information on the participation of NGOs in the domestic review of the NC6. According to the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters and Ukraine's domestic procedures, the draft NC6 was placed on the SEIA website one month prior to its adoption for open discussion and amendment. Moreover, NGO representatives were delegated by their respective organizations to IAC, where they participated in review and approval of the NC6 text.

119. The ERT encourages Ukraine to consider including in its next NC information on how the public participates in the preparation or domestic review of the NC. The ERT also encourages Ukraine to focus on education in environmental and climate issues in its next NC and instead of providing detailed information on the overall system of education.

III. Summary of reviewed supplementary information under the Kyoto Protocol

A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

120. Supplementary information provided by Ukraine under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is mostly complete and mostly transparent. The supplementary information is located in different sections of the NC6. Table 8 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, as well as references to the NC6 chapters in which this information is provided.

121. Ukraine has reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol in an official submission of an addendum to the NC6 on 28 October 2014:

(a) Identification of steps taken to promote and/or implement any decisions by ICAO and IMO to limit or reduce GHG emissions not included in the Montreal Protocol from aviation and marine bunker fuels;

(b) Information on what efforts Ukraine is making to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention.

122. In its NC6, Ukraine did not report descriptions of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and sustainable use of natural resources. During the review, Ukraine provided detailed additional information on this element. The ERT recommends that Ukraine include this reporting element in its next NC. The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 8
Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	Reference to the sixth national communication
National registry	Chapter 3.10, pp. 124–143
National system	Chapter 3.9, p. 115
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Chapter 1.3, p. 21
Policies and measures in accordance with Article 2	Chapter 4, p. 144; addendum
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Chapter 2.1, pp. 33–36
Information under Article 10	Chapter 1.6, p. 26; addendum
Financial resources	Chapter 6, p. 182

Note: Reporting on financial resources under the Kyoto Protocol is relevant for developed country Parties and other developed Parties that are included in Annex II to the Convention (Annex II Parties). As Ukraine is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

B. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

123. Ukraine reported the information requested in section II, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", of the annex to decision 15/CMP.1 as a part of its 2014 annual submission. The ERT noted, however, that Ukraine has reported partial information on how it gives priority to the actions taken to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol. In the addendum to its NC6, Ukraine reported information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be mostly complete and transparent. The ERT noted that Ukraine could continue exploring and reporting on the adverse impacts of the response measures and recommends that the Party enhance the completeness of reporting by including in its next annual submission further information on how it gives priority to the actions taken to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol regarding the minimization of adverse impacts of response measures to climate change.

124. The 2014 and previous national inventory reports and the addendum to the NC6 presented several initiatives of Ukraine aimed at minimizing adverse impacts, including cooperating in the development of clean and climate-friendly technologies in a number of countries, mainly developing countries, assisting developing Parties in diversifying their economies, conducting relevant research, providing education in climate-related and energy engineering fields to students and post-graduates of developing countries in Ukrainian universities and developing actions on adaptation to negative impacts of climate change in neighbouring countries, particularly developing countries. The ERT commends Ukraine for the information provided in the addendum to its NC6.

IV. Conclusions and recommendations

125. The ERT conducted a technical review of the information reported in the NC6 of Ukraine according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a general overview of the national climate policy of Ukraine. The information provided in the NC6 includes most elements of the supplementary information under Article 7 of the Kyoto Protocol, with the exception of some information on domestic legislative arrangements and enforcement and administrative procedures, and descriptions of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and sustainable use of natural resources. During the review, Ukraine provided the missing information, as well as additional information on its target under the Kyoto Protocol and under the Convention, changes to the domestic and regional programmes, changes to the legislative and institutional arrangements, projections and descriptions of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and sustainable use of natural resources.

126. On 28 October 2014, Ukraine officially submitted an addendum to its NC6 containing information regarding the minimization of adverse impacts on other Parties and methods on how Ukraine will promote and implement the decisions of ICAO and IMO, targeting reduction of emissions from international transportation. The addendum also provides information on technology transfer, support to developing countries in adaptation activities and capacity-building to developing countries through education of foreign students in Ukraine.

127. Ukraine's emissions for 2012 were estimated to be 57.4 per cent below its 1990 level excluding LULUCF and 57.1 per cent below including LULUCF. Emission decreases were driven by the transition from a centrally planned economy to a market economy and the structural changes in the economy, with an increase in the share of services, and more recently, by the global financial crisis.

128. In the NC6, Ukraine presents GHG projections for the period from 1990 to 2030. Three scenarios are included: baseline ('without measures'), 'with measures' and 'with additional measures'. The projected reductions in GHG emissions by 2020 under the baseline scenario, in relation to the 1990 levels, and under the 'with measures' and 'with additional measures' scenarios, are 46.0, 51.4 and 52.2 per cent, respectively. The projected reductions in GHG emissions by 2030 under the same scenarios, in relation to the 1990 levels, are 15.3, 42.6 and 44.9 per cent, respectively.

129. Based on a comparison of the target (920,837.93 kt CO_2 eq) and the average annual emissions (399,886.85 kt CO_2 eq) for the first commitment period of the Kyoto Protocol (2008–2012), Ukraine is in a position to meet its Kyoto Protocol target for the first

commitment period (100 per cent of the base year level). The projections indicate that Ukraine can meet its Kyoto Protocol target for the second commitment period (24.0 per cent reduction compared with the 1990 level in the period 2013–2020), even under the baseline scenario, and GHG emissions are not expected to exceed the Kyoto Protocol target, even by 2020. Under the Convention, Ukraine made a commitment to reducing its GHG emissions by 20.0 per cent by 2020 below the 1990 level; therefore, taking into account the projections, Ukraine likely will be able to meet its target under the Convention.

130. The NC6 contains information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. Ukraine does not need to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target for the first commitment period. Nevertheless, Ukraine is hosting a number of JI projects.

131. In its NC6, Ukraine reported limited information on its PaMs adopted, implemented and planned in achieving its commitments under the Convention. Information on PaMs was not structured by sector (energy, transport, industry, agriculture, forestry and waste management), or by gas, and it is lacking quantitative estimates of the impacts. The two major cross-cutting PaMs with the most significant mitigation impacts are in the energy sector: the sector energy efficiency and conservation programme and the state target economic programme for energy efficiency and development of production of energy from renewable energy and sources and alternative fuels, which are expected to achieve almost 70,000 kt CO_2 eq reductions by 2020.

132. Ukraine is a Party with an economy in transition included in Annex I to the Convention, but not included in Annex II, and it has no financial obligations pursuant to Article 4, paragraphs 3, 4 and 5, of the Convention, as well as no obligations to support and provide financial resources to developing countries under Article 11 of the Kyoto Protocol. However, on a voluntary basis, during the period 1999–2009, Ukraine provided financial support to overcome the consequences of extreme weather conditions, natural disasters and earthquakes in some developing countries. Ukraine has provided in its NC6 summary information on activities related to the transfer of technology and support to developing countries in accordance with Article 4 of the Convention and under Article 10 of the Kyoto Protocol, which are mainly related to activities of Ukrainian companies in the technology transfer of alternative energy resources and their use, for example, biofuels, and on actions to support capacity-building of developing countries through education of students in Ukrainian universities.

133. The information provided in the NC6 on climate change impacts, vulnerability and adaptation is mostly complete and transparent, and adheres to the UNFCCC reporting guidelines on NCs. The information covers diverse work on both vulnerability and adaptation, particularly on water-related issues, agriculture, food security and human health. According to the NC6, public health, multiple economy sectors and ecosystems, especially water resources, could be the sectors most affected in Ukraine by the negative impacts of climate change; for these areas, Ukraine is defining priority adaptation actions.

134. In its NC6, Ukraine has provided information on its actions relating to research and systematic observation, and addressed both domestic and international activities, including its participation in the Global Telecommunication System of WMO and GCOS. The Hydrometeorological Service of Ukraine takes part in almost all WMO programmes, particularly the Global Atmosphere Watch, World Weather Watch and Hydrology and Water Resources programmes. Ukraine has a well-developed network of research institutions that fulfil research and systematic observation. During the review, Ukraine provided information concerning support to developing countries by establishing meteorological stations in Armenia, Belarus and Republic of Moldova.

135. In its NC6, Ukraine has provided information on its actions relating to education, training and public awareness at both the domestic and international levels. Ukraine has a well-developed system of education, including education on the environment and climate from primary school level to university level. Ukraine has a systematic approach to the implementation of the Doha work programme concerning commitments on education, training and public awareness. A great number of: seminars in the fields of climatology, adaptation and mitigation of climate change, and economics of climate change; scientific and practical conferences; and round-table discussions have been conducted in the last few years, with participation of Ukrainian specialists, the public and representatives of NGOs.

136. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol is provided by Ukraine in its 2013 and 2014 annual submissions. In the addendum to its NC6, Ukraine reported additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, including several initiatives of cooperation in the development of clean and climate-friendly technologies and assistance to developing Parties in diversifying their economies and conducting relevant research.

137. In the course of the review, the ERT formulated several recommendations relating to the completeness and transparency of Ukraine's reporting under the Convention and its Kyoto Protocol. The key recommendations[11] are that Ukraine:

(a) Limit the number of pages in the executive summary to 15;

(b) Improve completeness of reporting by including in the next NC the following information:

(i) A description of changes to the registry due to the modernization or other activities in accordance with the requirements of the annex to decision 15/CMP.1;

(ii) Description of enforcement and administrative procedures in place to meet its commitments under the Kyoto Protocol, including the legal authority for such procedures, how they are implemented, and procedures for addressing cases of non-compliance under domestic law;

(iii) Any provisions to make information on legislative arrangements and enforcement and administrative procedures publicly accessible;

(iv) Description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of natural resources;

(v) On how Ukraine believes its PaMs are modifying long-term trends in anthropogenic GHG emissions and removals consistent with the objectives of the Convention;

(vi) Emission projections on PFC emissions, as well as on fuel sold to ships and aircraft engaged in international transport, to the extent possible, separately and not included in the totals;

(vii) Quantitative estimates of the estimated and expected total effect of its implemented and adopted PaMs on emissions aggregated at the sectoral and national levels in accordance with the 'with measures' definition, compared with a situation

[11] The recommendations are given in full in the relevant sections of this report.

without such PaMs presented in terms of GHG emissions avoided or sequestered, by gas;

(viii) Activities and actions, including planned activities, undertaken in fulfilment of the commitments under Article 10 of the Kyoto Protocol, and the steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention in order to facilitate the implementation of Article 10 of the Kyoto Protocol;

(ix) Outline of the action taken to implement Article 4, paragraph 1(e), of the Convention with regard to adaptation, and in particular on cooperation with other Parties to the Convention in preparing for adaptation to the impacts of climate change;

(x) Actual or planned actions taken to support capacity-building in developing countries in the area of research and systematic observation;

(c) Improve the transparency of reporting by including in the next NC the following information:

(i) The NC section on PaMs structured by sector and by gas, with each sector having its own textual description of the principal PaMs, supplemented by table 1 of the UNFCCC reporting guidelines on NCs, including information on name and short description of the PaM, objectives, GHGs affected, type of PaM, status of implementation, and implementing entity or entities;

(ii) On how Ukraine promotes and implements ICAO and IMO decisions to limit emissions from aviation and marine bunker fuels;

(iii) Accurate, consistent and complete data on projections, ensuring that quality control procedures are in place;

(iv) Projections in adherence to the scenario definitions set out in the UNFCCC reporting guidelines on NCs;

(v) Relevant information on factors and activities for each sector, if possible, in tabular format used in the projections analysis;

(vi) Domestic and international activities relating to research and systematic observation, in particular, cooperation with GCOS, the IGBP, the WCRP and the IPCC;

(d) Enhance the completeness of reporting by including in its next annual submission further information on how it gives priority to the actions taken to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol regarding the minimization of adverse impacts of response measures to climate change.

V. Questions of implementation

138. During the review, the ERT assessed the NC6, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness, transparency and adherence to the reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 23/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=20>.

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a02.pdf>.

FCCC/SBI/2011/INF.2. Compilation and synthesis of supplementary information incorporated in fifth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf02.pdf>.

FCCC/ARR/2013/UKR. Report of the individual review of the annual submission of Ukraine submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/ukr.pdf>.

FCCC/IRR/2007/UKR. Report of the review of the initial report of Ukraine. Available at <http://unfccc.int/resource/docs/2007/irr/ukr.pdf>.

FCCC/IDR.5/UKR. Report of the in-depth review of the fifth national communication of Ukraine. Available at <http://unfccc.int/resource/docs/2011/idr/ukr05.pdf>.

Sixth national communication of Ukraine. Available at <http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/6nc_v7_final_%5B1%5D.pdf>.

Addendum to the sixth national communication of Ukraine. Available at <http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/addendium.pdf>.

2013 GHG inventory submission of Ukraine. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php>.

2014 GHG inventory submission of Ukraine. Available at <http://http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Yurii Nabyvanets (Ukrainian Hydrometeorological Institute), Ms. Vira Balabukh (Ukrainian Hydrometeorological Institute), Mr. Pavlo Kartashov (State Environmental Investment Agency), Ms. Iryna Trofimova (State Environmental Investment Agency), Mr. Roman Kharytonov (State Environmental Investment Agency), Mr. Anatoliy Shmurak (State Environmental Investment Agency), Ms. Valentyna Slivinska (Budget Institution National Center for Inventory of Greenhouse Gases), Mr. Borys Kostyukovskyy (Bureau of Complex Analysis and Projections) and Mr. Iurii Petruk (Innovative EcoSystems Solutions), including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in Ukraine. The following documents[1] were also provided by Ukraine:

V.M. Shestopalov, Academician of NASU; V.F. Loginov, Acad. NAS Belarus; V.I. Osadchiy, NASU Corresponding Member, etc. 2011. *Global and Regional Climate Change*. Kyiv: Nika-Centre.

Mykhailo Chyzhenko. 2014. *Mitigation Actions, JI Projects*.

Ukraine JI Projects. Ukrainian Registry of Carbon Units official web-site. <http://www.carbonunitsregistry.gov.ua/en/258.htm>.

2014. Проекти за схемою зелених інвестицій (СЗІ). Projects for a Green Investment Scheme (GIS). Державне агентство екологічних інвестицій України.

Iryna Trofimova. 2014.Changes in domestic institutional arrangements;

Iryna Trofimova 2014.Recent developments of climate change policy;

Iryna Trofimova 2014. Description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of natural resources

Iryna Trofimova. 2014. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol on identification of steps taken to promote and/or implement any decisions by the International Civil Aviation Organization and the International Maritime Organization in order to limit or to reduce GHG emissions not included in the Montreal Protocol from aviation and marine bunker fuels;

Iryna Trofimova. 2014. Information on what efforts Ukraine is making to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention

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[1] Reproduced as received from the Party.